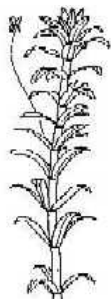


## Teacher Background Information

### Plants Alive (SC070105)

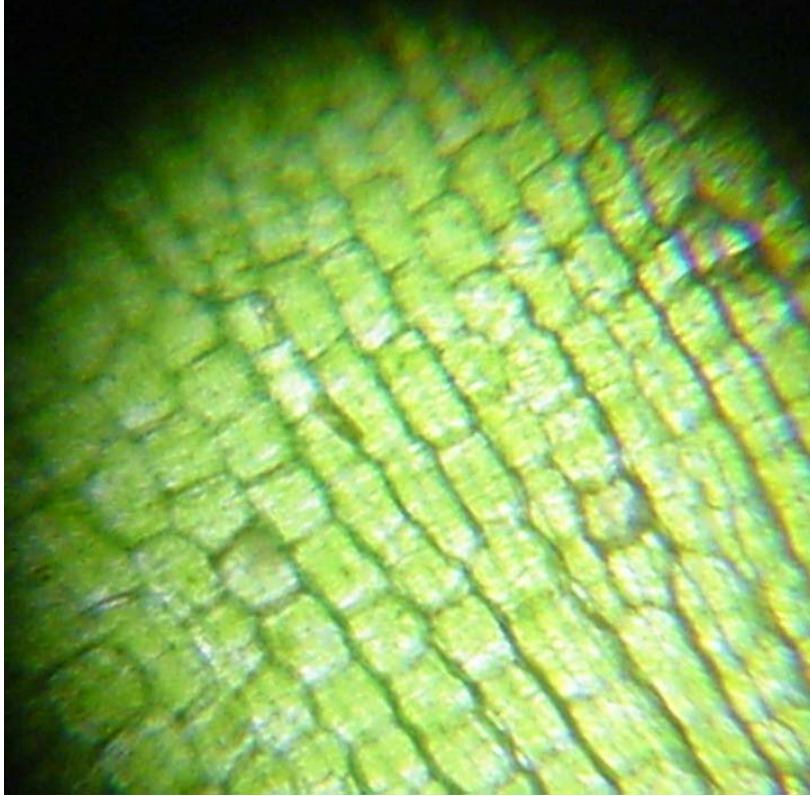
*Elodea* is both a genus and a common name for a group of related plants. The American *Elodea* is a submerged weed with broad leaves arranged in 4-leaf whorls around its stem. It is often sold in pet and aquarium stores under the common name Anacharis. *Elodea* is also the common name of a Florida freshwater plant in the genus *Hydrilla*, which has 3-leaf whorls.



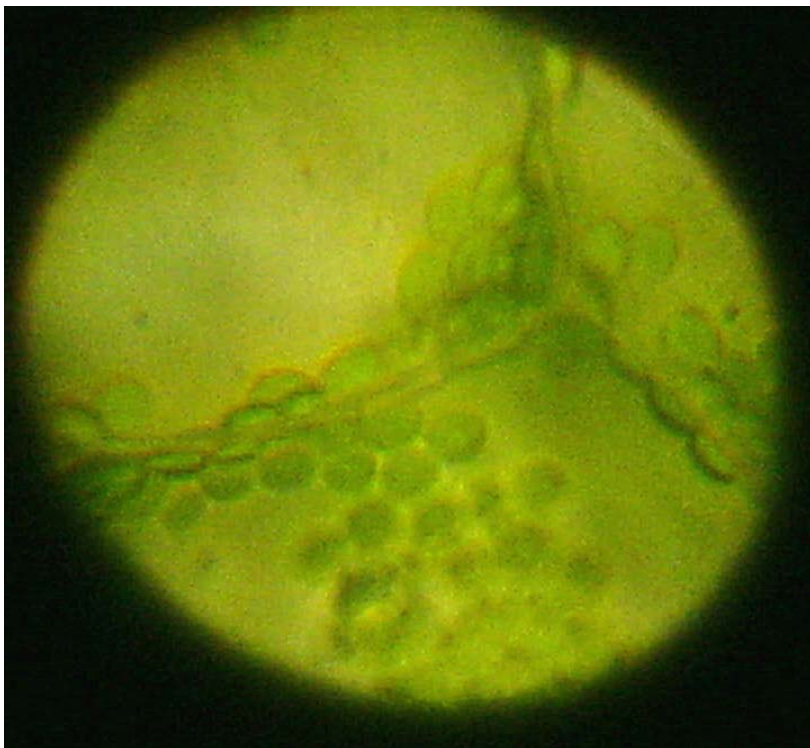
The use of *Elodea* in school labs dates at least from the first BSCS (Biological Sciences Curriculum Project) materials in the late 1960s. The plant is popular because it is inexpensive — you can get a bunch for \$1. Most leaves have only 2 layers of large, rectangular cells. Cell structure is easy to see under almost any microscope.

The purpose of this lesson is to demonstrate that plants use CO<sub>2</sub> during photosynthesis. Animals exhale CO<sub>2</sub> as a by-product of cellular respiration, as evidenced by the change in BTB color to yellow. Plants utilize the CO<sub>2</sub> during photosynthesis (evidenced by the change in BTB back to blue) and produce O<sub>2</sub> and sugar. I believe that photosynthesis is the primary concept, but it does build on previous labs and demonstrates that animals exhale CO<sub>2</sub> culminating in the dynamic relationship between producers and consumers. Watch for the misconception that plants make oxygen for animals to breathe. They don't; they make it for themselves.

**Do not allow drops of water near the hot light bulbs. The bulbs may explode.**



**Elodea**  
**low (40x)**



**high (400 x)**

Under low (40x) power, the arrangement of *Elodea* is visible. Under high (400x) power, the chloroplasts and cell walls are clearly visible. The plant has a high productivity (rate of photosynthesis) and produces visible bubbles of oxygen in laboratory conditions.

Once you buy *Elodea*, maintain it in oxygenated, non-chlorinated water. If you add it to an existing aquarium, within a week molds may kill it, or fish or snails may eat it. For this reason, plan to use the plants within a week of purchase. Always make a fresh, diagonal cut at the base of the plant's stem before using it for a lab.

The *Elodea* in “Plants Alive” should use the carbon dioxide in a 100 ml beaker of bromthymol blue/water solution in less than 20 minutes. The color change should look like this:



In assessing the responses on the Student Pages, be sure to emphasize the reasons for the answers: “Why do you think so?” The pattern of response “I think this because...” is the beginning of scientific reasoning, and allows students to generate testable questions from their hypotheses.